AiP74AHC/AHCT1G32
Single 2-Input Or Gate

Product Specification

Specification Revision History：

Version	Date	Description
2023-06-A0	2023-06	New
2023-10-A1	2023-10	Modify parameters
2024-07-A2	2024-07	Modify the content
2025-03-A3	2025-03	Modify the content

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1、General Description

The AiP74AHC1G32/AiPAHCT1G32 is a single 2-input or gate circuit.

Features:

- Supply voltage range:
  AiP74AHC1G32: 2V to 5.5V
  AiP74AHCT1G32: 4.5V to 5.5V
- Low power dissipation
- Specified from -40℃ to +125℃
- Package information: SOT23-5/SOT353

Ordering Information:

Reel packing specifications:

Part number	Packaging form	Marking code	Reel quantity	Boxed reel quantity	Notes
AiP74AHC1G32GB235.TR	SOT23-5	ETXX	3000PCS/reel	30000PCS/box	Dimensions of plastic enclosure: 2.9mm×1.6mm Pin spacing: 0.95mm
AiP74AHC1G32GC353.TR	SOT353	ETXX	3000PCS/reel	30000PCS/box	Dimensions of plastic enclosure: 2.1mm×1.3mm Pin spacing: 0.65mm
AiP74AHCT1G32GB235.TR	SOT23-5	GCXX	3000PCS/reel	30000PCS/box	Dimensions of plastic enclosure: 2.9mm×1.6mm Pin spacing: 0.95mm
AiP74AHCT1G32GC353.TR	SOT353	GCXX	3000PCS/reel	30000PCS/box	Dimensions of plastic enclosure: 2.1mm×1.3mm Pin spacing: 0.65mm

Note 1: “XX” refers to variable content, meaning year and package batch serial number.

Note 2: If the physical information is inconsistent with the ordering information, please refer to the actual product.

2、Block Diagram And Pin Description

2.1、Block Diagram

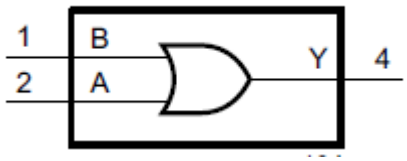


Figure 1. Logic symbol

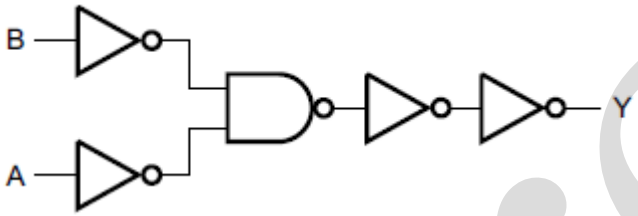
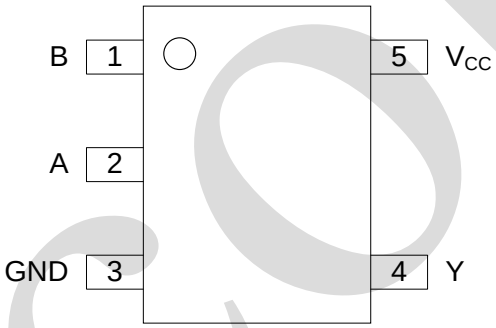


Figure 2. IEC logic symbol

2.2、Pin Configurations



2.3、Pin Description

Pin No.	Pin Name	Description
1	B	data input
2	A	data output
3	GND	ground (0V)
4	Y	data output
5	V_{CC}	supply voltage

2.4、Function Table

Input		Output
A	**B**	**Y**
L	L	L
L	H	H
H	L	H
H	H	H

Note: H=HIGH voltage level; L=LOW voltage level

3、Electrical Parameter

3.1、Absolute Maximum Ratings

(T_{amb}=25℃, GND=0V, unless otherwise specified)

Characteristic	Symbol	Conditions	Min.	Max.	Unit
power supply voltage	V_{CC}	-	-0.5	+7.0	V
input voltage	V_I	-	-0.5	+7.0	V
input clamping current	I_{IK}	V_I<-0.5V	-20	-	mA
output clamping current	I_{OK}	V_O<-0.5V or V_O>V_{CC}+0.5V	-	±20	mA
output current	I_O	-0.5V<V_O<V_{CC}+0.5V	-	±25	mA
supply current	I_{CC}	-	-	75	mA
ground current	I_{GND}	-	-75	-	mA
storage temperature	T_{stg}	-	-65	+150	℃
total power dissipation	P_{tot}	-	-	250	mW
soldering temperature	T_L	10s	260		℃

3.2、Recommended Operating Conditions

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
AiP74AHC1G32						
power supply voltage	V_{CC}	-	2.0	5.0	5.5	V
input voltage	V_I	-	0	-	5.5	V
output voltage	V_O	-	0	-	V_{CC}	V
ambient temperature	T_{amb}	-	-40	-	+125	℃
AiP74AHCT1G32						
power supply voltage	V_{CC}	-	4.5	5.0	5.5	V
input voltage	V_I	-	0	-	5.5	V
output voltage	V_O	-	0	-	V_{CC}	V
ambient temperature	T_{amb}	-	-40	-	+125	℃

3.3、Electrical Characteristics

3.3.1、DC Characteristics 1

(T_{amb} =-40℃ to +85℃, GND=0V, unless otherwise specified)

Parameter	Symbol	Vcc	Conditions	Min.	Typ.	Max.	Unit
AiP74AHC1G32							
HIGH-level input voltage	V_{IH}	2.0V	-	1.5	-	-	V
		3.0V	-	2.1	-	-	V
		5.5V	-	3.85	-	-	V
LOW-level output voltage	V_{IL}	2.0V	-	-	-	0.5	V
		3.0V	-	-	-	0.9	V
		5.5V	-	-	-	1.65	V
HIGH-level output voltage	V_{OH}	2.0V	I_O=-50uA	1.9	2.0	-	V
		3.0V	I_O=-50uA	2.9	3.0	-	V
		4.5V	I_O=-50uA	4.4	4.5	-	V
		3.0V	I_O=-4mA	2.48	-	-	V
		4.5V	I_O=-8mA	3.8	-	-	V
LOW-level output voltage	V_{OL}	2.0V	I_O=50uA	-	0	0.1	V
		3.0V	I_O=50uA	-	0	0.1	V
		4.5V	I_O=50uA	-	0	0.1	V
		3.0V	I_O=4mA	-	-	0.44	V
		4.5V	I_O=8mA	-	-	0.44	V
input leakage current	I_I	0V to 5.5V	V_I=5.5V or GND	-	-	1.0	uA
supply current	I_{CC}	5.5V	V_I=V_{CC} or GND	-	-	10	uA
AiP74AHCT1G32							
HIGH-level input voltage	V_{IH}	4.5V to 5.5V	-	2.0	-	-	V
LOW-level input voltage	V_{IL}	4.5V to 5.5V	-	-	-	0.8	V
HIGH-level output voltage	V_{OH}	4.5V	I_O=-50uA	4.4	4.5	-	V
		4.5V	I_O=-8mA	3.8	-	-	V
LOW-level output voltage	V_{OL}	4.5V	I_O=50uA	-	0	0.1	V
		4.5V	I_O=8mA	-	-	0.44	V
input leakage current	I_I	0V to 5.5V	V_I=5.5V or GND	-	-	1.0	uA
supply current	I_{CC}	5.5V	V_I=V_{CC} or GND; Io=0A	-	-	10	uA
additional supply current	ΔI_{CC}	5.5V	single input pin; V_I=3.4V; other inputs at Vcc or GND	-	-	1.5	mA

3.3.2、DC Characteristics 2

(T_{amb}=-40℃ to +125℃, GND=0V, unless otherwise specified)

Parameter	Symbol	Vcc	Conditions	Min.	Typ.	Max.	Unit
AiP74AHC1G32							
HIGH-level input voltage	V_{IH}	2.0V	-	1.5	-	-	V
		3.0V	-	2.1	-	-	V
		5.5V	-	3.85	-	-	V
LOW-level input voltage	V_{IL}	2.0V	-	-	-	0.5	V
		3.0V	-	-	-	0.9	V
		5.5V	-	-	-	1.65	V
HIGH-level output voltage	V_{OH}	2.0V	I_O=-50uA	1.9	-	-	V
		3.0V	I_O=-50uA	2.9	-	-	V
		4.5V	I_O=-50uA	4.4	-	-	V
		3.0V	I_O=-4mA	2.4	-	-	V
		4.5V	I_O=-8mA	3.7	-	-	V
LOW-level output voltage	V_{OL}	2.0V	I_O=50uA	-	-	0.1	V
		3.0V	I_O=50uA	-	-	0.1	V
		4.5V	I_O=50uA	-	-	0.1	V
		3.0V	I_O=4mA	-	-	0.55	V
		4.5V	I_O=8mA	-	-	0.55	V
input leakage current	I_I	0V to 5.5V	V_I=5.5V or GND	-	-	2.0	uA
supply current	I_{CC}	5.5V	V_I=V_{CC} or GND	-	-	40	uA
AiP74AHCT1G32							
HIGH-level input voltage	V_{IH}	4.5V to 5.5V	-	2.0	-	-	V
LOW-level input voltage	V_{IL}	4.5V to 5.5V	-	-	-	0.8	V
HIGH-level output voltage	V_{OH}	4.5V	I_O=-50uA	4.4	-	-	V
		4.5V	I_O=-8mA	3.7	-	-	V
LOW-level output voltage	V_{OL}	4.5V	I_O=50uA	-	-	0.1	V
		4.5V	I_O=8mA	-	-	0.55	V
input leakage current	I_I	0V to 5.5V	V_I=5.5V or GND	-	-	2.0	uA
supply current	I_{CC}	5.5V	V_I=V_{CC} or GND; Io=0A	-	-	40	uA
additional supply current	ΔI_{CC}	5.5V	single input pin; V_I=3.4V; other inputs at Vcc or GND	-	-	1.5	mA

3.3.3、AC Characteristics 1

(T_{amb} =40℃ to +85℃, GND=0V, tr=tf=≤3.0ns, unless otherwise specified)

Parameter	Symbol	Vcc	Conditions	Min.	Typ.	Max.	Unit
AiP74AHC1G32							
propagation delay	t_{pd}	3.0V to 3.6V[2]	A and B to Y C_L=15pF See Figure 4[1]	-	4.4	9.5	ns
		3.0V to 3.6V[2]	A and B to Y C_L=50pF See Figure 4[1]	-	6.3	13.0	ns
		4.5V to 5.5V[3]	A and B to Y C_L=15pF See Figure 4[1]	-	3.2	6.5	ns
		4.5V to 5.5V[3]	A and B to Y C_L=50pF See Figure 4[1]	-	4.6	8.5	ns
AiP74AHCT1G32							
propagation delay	t_{pd}	4.5V to 5.5V[3]	A and B to Y C_L=15pF See Figure 4[1]	-	3.3	8.0	ns
		4.5V to 5.5V[3]	A and B to Y C_L=50pF See Figure 4[1]	-	4.8	9.0	ns

Note:

[1] t_{pd} is the same as t_{PLH} and t_{PHL}.

[2] Typical values are measured at V_{CC}=3.3V.

[3] Typical values are measured at V_{CC}=5V.

3.3.4、AC Characteristics 2

(T_{amb} =40℃ to +125℃, GND=0V, tr=tf=≤3.0ns, unless otherwise specified)

Parameter	Symbol	Vcc	Condition	Min.	Typ.	Max.	Unit
AiP74AHC1G32							
propagation delay	t_{pd}	3.0V to 3.6V	A and B to Y C_L=15pF See Figure 4[1]	-	-	10.0	ns
		3.0V to 3.6V	A and B to Y C_L=50pF See Figure [1]	-	-	14.5	ns
		4.5V to 5.5V	A and B to Y C_L=15pF See Figure 4[1]	-	-	7.0	ns
		4.5V to 5.5V	A and B to Y C_L=50pF See Figure 4[1]	-	-	9.5	ns
AiP74AHCT1G32							
propagation delay	t_{pd}	4.5V to 5.5V	A and B to Y C_L=15pF See Figure 4[1]	-	-	9.0	ns
		4.5V to 5.5V	A and B to Y C_L=50pF	-	-	10	ns

			See Figure 4[1]				

Note:

[1] t_{pd} is the same as t_{PLH} and t_{PHL}.

4、Testing Circuit

4.1、AC Testing Circuit

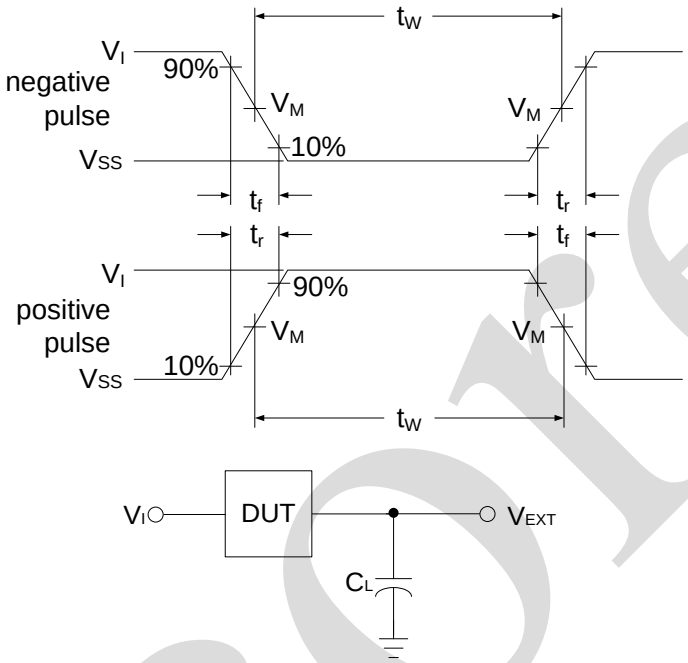


Figure 3. External load circuit

Definitions for test circuit：

C_L=Load capacitance including jig and probe capacitance.

4.2、AC Testing Waveforms

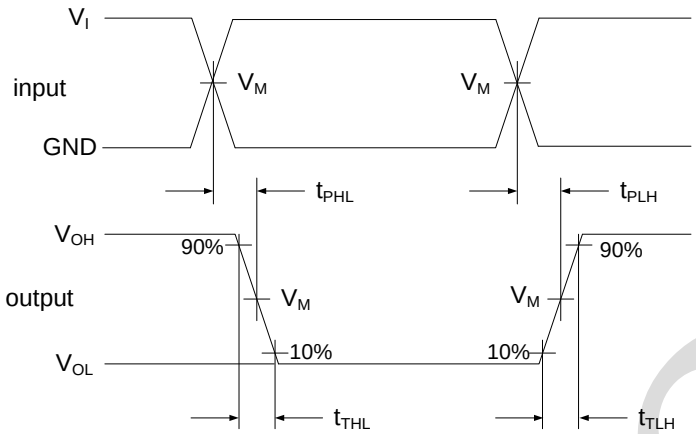


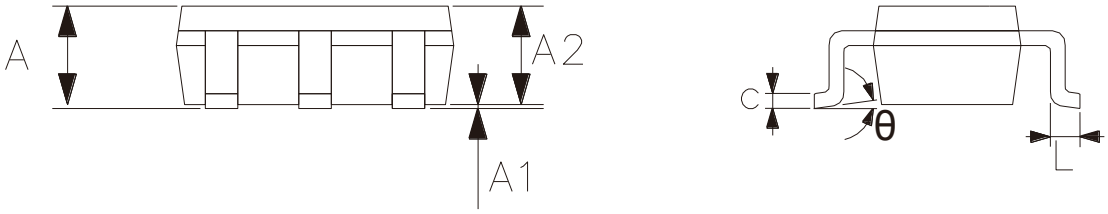
Figure 4. The input (A and B) to output (Y) propagation delays

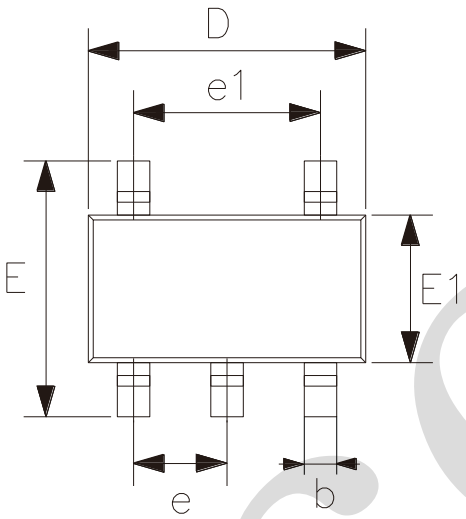
4.3、Measurement Points

Category	Input		Output
	V_I	V_M	V_M
AiP74AHC1G32	GND to V_{CC}	$0.5\times V_{CC}$	$0.5\times V_{CC}$
AiP74AHCT1G32	GND to 3.0V	1.5V	$0.5\times V_{CC}$

5、Package information

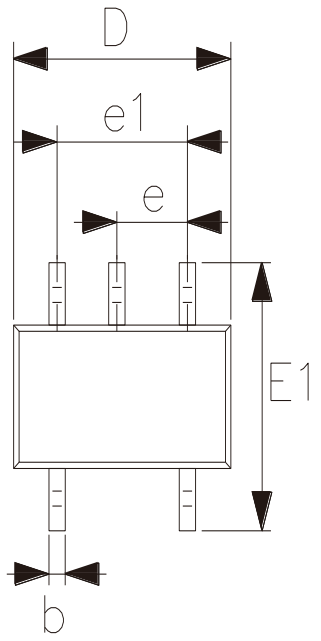
5.1、SOT23-5

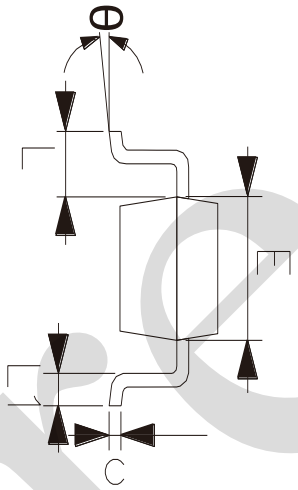


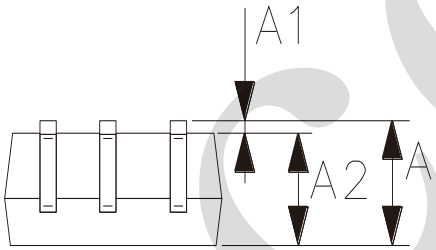


2023/12/A	Dimensions In Millimeters	
Symbol	Min.	Max.
A	—	1.26
A1	0.00	0.12
A2	1.00	1.20
b	0.30	0.50
c	0.10	0.20
D	2.82	3.02
E	2.60	3.00
E1	1.50	1.70
e	0.95	
e1	1.80	2.00
L	0.30	0.60
θ	0°	8°

5.2、SOT353







2023/12/A	Dimensions In Millimeters	
Symbol	**Min.**	**Max.**
A	0.90	1.10
A1	0.00	0.10
A2	0.90	1.00
b	0.15	0.35
c	0.11	0.175
D	2.00	2.20
E	1.15	1.35
E1	2.15	2.45
e	0.65	
e1	1.20	1.40
L	0.525	
L1	0.26	0.46
θ	0°	8°

6、Statements And Notes

6.1、The name and content of Hazardous substances or Elements in the product

Part name	Hazardous substances or Elements									
	Lead and lead compounds	Mercury and mercury compounds	Cadmium and cadmium compounds	Hexavalent chromium compounds	Polybrominated biphenyls	Polybrominated biphenyl ethers	Dibutyl phthalate	Butylbenzyl phthalate	Di-2-ethylhexyl phthalate	Diisobutyl phthalate
Lead frame	○	○	○	○	○	○	○	○	○	○
Plastic resin	○	○	○	○	○	○	○	○	○	○
Chip	○	○	○	○	○	○	○	○	○	○
The lead	○	○	○	○	○	○	○	○	○	○
Plastic sheet installed	○	○	○	○	○	○	○	○	○	○
explanation	○：Indicates that the content of hazardous substances or elements in the detection limit of the following the SJ/T11363-2006 standard. ×：Indicates that the content of hazardous substances or elements exceeding the SJ/T11363-2006 Standard limit requirements.									

6.2、Notes

We recommend you to read this chapter carefully before using this product.

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